"COMPARISON OF HIGH AEROBIC CAPACITY AND LOW AEROBIC CAPACITY SPORTSPERSONS IN HEALTH RELATED PHYSICAL FITNESS AND SELECTED PSYCHOLOGICAL VARIABLES"

SYNOPSIS

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By

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CHAPTER I

INTRODUCTION

Physical Education is an integral part of the total education of every child from kindergarten through grade 12. Therefore, every student should have the opportunity to participate in a quality physical education program. It is the role of quality physical education programs to help students develop health-related fitness, physical competence in movement activities, cognitive understanding, and positive attitudes toward physical activity so that they can adopt healthy and physically active lifestyles. Quality programs are also important because they provide learning experiences that meet a student's developmental needs, which in turn helps to improve the mental alertness, academic performance, readiness, and enthusiasm for learning.

A balanced physical education program provides each student with an opportunity to develop into a physically-educated person; one who learns skills necessary to perform a variety of physical activities, is physically fit, participates regularly in physical activity, knows the benefits from involvement in physical activity and it's contributions to a healthy lifestyle.

Physical education prepares students to participate in activities they can perform when they are adults. The physical education program will be of little value to the majority of adults if it is restricted to team sports. Participation in sport activities declines rapidly with age. Less than five percent of adults above the age 30 report playing a team sport (U.S. Dept. 1996)

Since the beginning of time, survival has been a daily struggle. Simply staying alive was physically demanding. Yet, humans in industrialized societies over the last 150 years have become spoiled. We live in our minds so much of the

time that we have almost forgotten that we have a body. Many people work in offices that make their living by reading, writing, speaking, and thinking, but seldom by physical labor.

A person who is fit is capable of living life to its fullest extent. Physical and mental fitness play very important roles in your lives and people who are both, physically and mentally fit are less prone to medical conditions as well.

Fitness does not only refer to being physically fit, but also refers to a person"s mental state as well. If a person is physically fit, but mentally unwell or troubled, he or she will not be able to function optimally. Mental fitness can only be achieved if your body is functioning well. You can help relax your own mind and eliminate stresses by exercising regularly and eating right.

Why is it Important to Be Physically Fit? People who are physically fit are also healthier, are able to maintain their most optimum weight, and are also not prone to cardiac and other health problems. In order to maintain a relaxed state of mind, a person should be physically active. A person who is fit both physically and mentally is strong enough to face the ups and downs of life, and is not affected by drastic changes if they take place.

STATEMENT OF THE PROBLEM

While going through the literature available in the library and the discussion with the faculty members in relation with the topic, the research scholar has under taken the study stated as **"Comparison Of High Aerobic Capacity And Low Aerobic Capacity Sportspersons In Health Related Physical Fitness And Selected Psychological Variables".**

SIGNIFICANCE OF THE STUDY

The significance of the study was justified on the basis of the following basis:

1. The finding of the study would help to know the Health related physical fitness level of High aerobic capacity sportspersons and Low aerobic capacity sportspersons.
2. The finding of the study would help to know the level of selected psychological variables of High aerobic capacity sportspersons and Low aerobic capacity sportspersons.
3. The study would help to know the relationship of Health related physical fitness and psychological variables of High aerobic capacity sportspersons and Low aerobic capacity sportspersons.
4. The difference in the Health related physical fitness of High aerobic capacity sportspersons and Low aerobic capacity sportspersons will be known.
5. The difference in selected psychological variables of High aerobic capacity sportspersons and Low aerobic capacity sportspersons will be known.

OBJECTIVES OF THE STUDY

The following objectives of the study are as

1. The primary objective of the study is to compare health related physical fitness among High and Low aerobic capacity sportspersons.
2. The secondary objective of the study is to compare psychological variables among High and Low aerobic capacity sportspersons.

HYPOTHESIS OF THE STUDY

On the bases of available literature and discussion with experts, as well as the research scholars own understanding, It is hypothesized that:

1. H1.There will be significant difference in cardio-vascular endurance between High and Low aerobic capacity sportspersons.
2. H2.There will be significant difference in Muscular strength between High aerobic and Low aerobic capacity sportspersons.
3. H3.There will be significant difference in Muscular endurance between High and Low aerobic capacity sportspersons.
4. H4.There will be significant difference in Flexibility between High and Low aerobic capacity sportspersons.
5. H7.There will be significant difference in Anxiety between High and Low aerobic capacity sportspersons.
6. H6.There will be significant difference in Mental Health between High and Low aerobic capacity sportspersons in relation to somatic symptoms, insomnia, social Dys-function and severe depression

DELIMITATIONS

1. The study will be delimited to students of Kashmir division of Jammu And Kashmir State only.
2. The study will be delimited for the sportspersons who are studying in Govt. colleges affiliated to university of Kashmir.
3. The study will be delimited for the sportspersons who have participated at inter-collegiate competitions.
4. The study will be delimited to the sportspersons between 18 to 28 years of age.
5. The study will be delimited to the male sportspersons only.
6. The study will be delimited to UG students of govt. colleges of Kashmir division.

7. The study will be further delimited to 200 subjects (100 subjects of High aerobic capacity sportspersons and 100 subjects of Low aerobic capacity sportspersons).
8. The study will be delimited to the following components of health related physical fitness:
    - Cardio-vascular endurance.
    - Muscular strength.
    - Muscular endurance.
    - Flexibility.
9. The study will be restricted to the following psychological variables.
    (a) Anxiety
    (b) Mental health

LIMITATIONS

The study will be limited in the following aspects:

1. The scholar will not use any motivational technique to motivate or discourage the students when various tests will be taken.
2. Economic Status will not be considered.
3. In this study caste & Religion of the Subjects will not be considered.

DEFINITIONS & EXPLAINATION OF TERMS

Aerobic capacity

Aerobic capacity is the maximum amount of oxygen that the body can utilize during an exercise session, usually measured during a brief period of high-intensity exercise.

Physical fitness

Physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to engage in leisure pursuits and to meet emergency situations.

Health

Health is a state of complete physical, mental, emotional, spiritual and not merely an absence of disease or infirmity.

Health related physical fitness

It is the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to engage in leisure pursuits and to meet emergency situations. It includes 5 main components. i.e. muscular strength, muscular endurance, cardiovascular endurance, flexibility and body composition

Anxiety

Anxiety is a psychological and physiological state characterized by somatic, emotional, cognitive, and behavioral components. It is the displeasing feeling of fear and concern.

Mental health

It refers to our cognitive, and/or emotional wellbeing - it is all about how we think, feel and behave. Mental health, if somebody has it, can also mean an absence of a mental disorder.

Sportspersons

In this study, sportspersons refers to those student players who are studying in Govt. colleges of Kashmir division affiliated to university of Kashmir and have participated in inter-collegiate competitions.

CHAPTER II
REVIEW OF RELATED LITERATURE

Greenleaf C (2014) To date, research has focused primarily on psychological correlates of weight-based teasing. In this study, we extended previous work by also examining physical health-related variables (eg, physical self-concept and physical fitness [PF]).Participants included 1419 middle school students (637 boys and 782 girls). Of these, 245 (17.3%) reported being teased about being overweight. Participants completed measures of self-esteem, depression, physical self-concept, physical activity (PA) self-efficacy, and self-report physical and sedentary activities. Participants also completed PF testing. After controlling for demographic characteristics, participants who were teased about being overweight had higher scores on depression and lower scores on self-esteem, physical self-concept, PA self-efficacy, and health-related measures of PF in comparison to participants who were not teased. The results of this study support previous research indicating relationships between teasing and low levels of psychological well-being, physical self-concept, and PA self-efficacy, and establishes one between weight-based teasing and different types of PF. Research is needed to determine the potential causal nature of the relationships between teasing and fitness and evidence-based interventions are needed to reduce weight-based teasing and its potential effects on health and well-being.

Madison G (2013) To assess the physical and psychological effects across 11 weeks of music-exercise sessions, the participants' training experience, and

attitudes towards physical activity. The effect of different music information was also investigated. Overall, 146 sedentary volunteers were randomized into 4 exercise groups and each group received different music information. Physical capacity and psychological measures were obtained. Increased performance in oxygen uptake and flexibility and decreased blood pressure was found. Participants reported increased wellbeing and body-awareness, and an intention to remain physically active. No differences between groups were found. Music-exercise can be recommended to promote physical activity among sedentary individuals. The amount of musical information in synchronous music seems not to have any effects on self-selected intensity or physiological benefits.

Tomporowski P.D(2011) This review provides a historical overview of physical activity interventions designed by American educators and an evaluation of research that has assessed the effects of exercise on children's mental function. Historical descriptions of the emergence of American physical education doctrine throughout the 20th century were evaluated. Prior reviews of studies that assessed the effects of single acute bouts of exercise and the effects of chronic exercise training on children's mental function were examined and the results of recent studies were summarized. Physical activity interventions designed for American children have reflected two competing views: activities should promote physical fitness and activities should promote social, emotional, and intellectual development. Research results indicate that exercise fosters the emergence of children's mental function; particularly executive functioning. The route by which physical activity impacts mental functioning is complex and is likely moderated by several variables, including physical fitness level, health status, and numerous psycho-social factors. Physical activity interventions for children should be designed to meet multiple objectives; e.g., optimize physical fitness, promote health-related behaviors that offset obesity, and facilitate mental development.

de Geus EJ1993 Jul-Aug This study assessed the association of aerobic fitness with psychological make-up and physiological stress-reactivity in a group of untrained men, as well as the effects of 4 and 8 months of exercise training on these parameters. Psychological assessment included questionnaires on personality (Neuroticism, Type A, Hostility), coping styles (Anger In, Anger Out), negative affect (Depression, Anxiety), and self-esteem. Stress reactivity was measured as the cardiovascular and urinary catecholamine response to two competitive reaction time tasks and the cold pressor test. No cross sectional relationships were found between aerobic fitness, defined as the maximal oxygen consumption during an exhaustive exercise test, and any of the psychological variables. In addition, psychological make-up did not change as a consequence of exercise training. In further contrast to our hypothesis, aerobic fitness was associated with high, rather than low, cardiovascular reactivity. Longitudinal effects of training were limited to a reduction in the overall levels of heart rate and diastolic blood pressure. This suggests that regular exercise does not increase the resistance to stress-related disease by influencing psychological make-up or acute psycho physiologic reactivity.

Fahlman M.M (2006) The purpose of this study was to determine if high school females differed in individual measures of health-related physical fitness, barriers to exercise, or activity level based on ethnicity or socioeconomic status. A cross-sectional sample consisting of African American (28%), Hispanic (23%), and white (49%) female high school students, 46% from low socioeconomic groups and 54% from moderate or high socioeconomic groups (n = 1314, age = 16.2 +/- 0.9) participated in this study. A 15-question survey instrument assessed barriers to exercise and activity level. The FITNESSGRAM fitness test assessed aerobic capacity and body mass index (BMI), and skin fold calipers were used to assess percent body fat. Significant

differences between African Americans, Hispanics, and whites were found on the following dependent variables: BMI, percent fat, mile run, perceived barriers to exercise, and activity level. Significant differences between socioeconomic groups were found on the following dependent variables: percent fat, mile run, activity level, and perceived barriers to exercise. These results suggest that students of minority and low socioeconomic groups should be given separate and different interventions regarding health-related fitness.

Crews D.J (2004) Psychological well-being has been generally associated with vigorous aerobic activity and structured aerobic activity in adolescents and children. Low-income children are at greater risk than the general population for experiencing high environmental stress and increased mental health problems. This study investigated the effects of a structured physical fitness program on psychological well-being in low-income Hispanic children. A total of 66, 33 girls, 33 boys, in Grade 4 were randomly assigned to either an Aerobic intensity ($n = 34$) or a Control intensity physical activity program ($n = 32$) for 6 wk. Psychological well-being was defined as scores on trait anxiety, depression, and self-esteem, measured, respectively, by the Trait Anxiety Inventory, Beck Depression Inventory, and Rosenberg Self-esteem scale. Analysis showed the children in the Aerobic intensity program significantly ($p < .05$) improved their cardiovascular fitness as measured by the PWC170 test. After the program was over, the children in this Aerobic group reported significantly ($p < .05$) less depression. The main effect for self-esteem reflected the Aerobic group's greater self-reported self-esteem. No differences were found on trait anxiety. The effects on depression and self-esteem may only be attributed to the cardiovascular improvement given the higher intensity physical activity program because causation was not assessed here.

Perry A.C et. al., (2002) To compare physical characteristics, health and fitness-related variables, and nutrient intake between

children of Japanese ancestry living in the United States and Japan. Fourteen children of Japanese descent living in the United States and 14 sex- and age-matched children living in Japan.

US and Japanese resident groups were compared on physical characteristics, health and fitness-related variables, and nutrient intake using the t test for paired samples. To assess differences between groups in variables not statistically significant, effect sizes were calculated using the Cohen d test of standardized differences. The following significant differences were found between US and Japanese resident groups, respectively: body mass index, 19.3 and 16.9, P =.02; percentage of body fat, 22.0% and 14.3%, P =.002; diastolic blood pressure, 65.8 and 58.9 mm Hg, P =.01; total cholesterol, 169.8 and 138.7 mg/dL (4.39 and 3.59 mmol/L, P =.001); low-density lipoprotein cholesterol, 108.2 and 88.0 mg/dL (2.80 and 2.28 mmol/L, P =.01); triglycerides, 92.5 and 59.0 mg/dL (1.04 and 0.67 mmol/L, P =.02); percentage of fat intake, 26.1% and 20.3%, P =.001; percentage of saturated fat intake, 7.9% and 6.1%, P<.002; percentage of carbohydrate intake, 57.9% and 63.9% (P =.004); vertical jump, 28.9 and 34.4 cm, P =.02; and flexibility, 58.2 and 42.6 cm, P =.002. Using the Cohen d test, US residents showed a moderately greater systolic blood pressure (107.5 vs 101.9 mm Hg, P =.10) and leg strength (81.5 vs 55.8 kg, P =.11) than did Japanese residents.

CONCLUSIONS:A small sample (n = 14) of children of Japanese descent living in Florida showed more adverse health-related characteristics than did a comparable group of their peers living in Japan. The results are probably related to differences in their diets. It remains to be seen whether the differences in diets are related to where the children live.

De Geus E.J (1993) This study assessed the association of aerobic fitness with psychological make-up and physiological stress-reactivity in a group of untrained men, as well as the effects of 4 and 8 months of exercise training on

these parameters. Psychological assessment included questionnaires on personality (Neuroticism, Type A, Hostility), coping styles (Anger In, Anger Out), negative affect (Depression, Anxiety), and self-esteem. Stress reactivity was measured as the cardiovascular and urinary catecholamine response to two competitive reaction time tasks and the cold pressor test. No cross sectional relationships were found between aerobic fitness, defined as the maximal oxygen consumption during an exhaustive exercise test, and any of the psychological variables. In addition, psychological make-up did not change as a consequence of exercise training. In further contrast to our hypothesis, aerobic fitness was associated with high, rather than low, cardiovascular reactivity. Longitudinal effects of training were limited to a reduction in the overall levels of heart rate and diastolic blood pressure. This suggests that regular exercise does not increase the resistance to stress-related disease by influencing psychological make-up or acute psycho physiologic reactivity.

CHAPTER III

METHODOLOGY

As every research demands a systematic method and procedure likewise this chapter adopts the following procedures including information regarding source of data, sampling method, selection of subjects, collection of data, criterion Measures etc. A research become successful accompanied and supported by some reliable and authentic data. The statistical analysis of the gathered data will provides a well-knit picture of a complete and successful hypothesis as pre-selected by the researcher. The chapter has been divided into the following headings:

- **Source of data**
- **Selection of Subjects**
- **Tools of the study**
- **Selection of variables**
- **Administration of the test**
- **Analysis of data**

SOURCE OF DATA

For the Present study, the source of subjects will be selected from the Govt. colleges of Kashmir division affiliated to University of Kashmir in Jammu And Kashmir State.

SELECTION OF SUBJECT

Two groups will be targeted i, e High aerobic capacity sportspersons group and Low aerobic capacity sportspersons group. The sportspersons will be tested through Harvard Step Test. Exactly one minute after the exercise, the tester starts by counting the pulse rate and records the same duration from 1 to 1.5 minutes, 2 to 2.5 minutes, and 3 to 3.5 minutes. The pulse of all the three half minute counts recorded are added together. The scoring will be done according to the following formula:

(Duration of exercise period in seconds x 100 / 2 x sum of three pulse counts of after exercise)

The value of the score will be evaluated as per the following standards:

Fitness index score	Fitness condition
Up to 54	Poor
Between 55-64	Low average
Between 65-79	High average
Between 80-89	Good
90 and Above	Excellent

In this study, the high aerobic capacity sportspersons will be considered those whose fitness condition Under Harverd step test will be 65 and Above, whereas, the low aerobic capacity sportspersons will be considered those whose fitness condition under Harverd step test will be 64 and Below of it.

TOOLS OF THE STUDY

Measuring Tape, Stop Watch, Mats, Sit and Reach Box or flex measure, A yard stick, 20 Inch high Bench, General mental health questionnaire by Goldberg in 1978 and Sport Competition Anxiety Test (SCAT) questionnaire developed by Martens et al. in 1990 will be used for collection of data.

SELECTION OF VARIABLES

The following variables were selected:-

i) Cardio-vascular endurance
ii) Muscular strength
iii) Muscular endurance
iv) Flexibility
v) Mental health
vi) Anxiety

ADMINISTRATION OF THE TEST

Cardio- vascular endurance (Harvard Step Test):

Equipment: Step or platform 20 inches / 50.8 cm high, stopwatch, metronome.

Procedure: The athlete steps up and down on the platform at a rate of 30 steps per minute (every two seconds) for 5 minutes or until exhaustion. Exhaustion is defined as when the athlete cannot maintain the stepping rate for 15 seconds. The athlete immediately sits down on completion of the test, and the total number of heart beats are counted between 1 to 1.5 minutes after finishing (see measuring heart rate). This is the only measure required if using the short form of the test. If the long form of the test is being conducted, there is an additional heart rate measures at between 2 to 2.5 minutes, and between 3 to 3.5 minutes.

Scoring: The fitness index score is determined by the following equations. For example, if the total test time was 300 seconds (if completed the whole 5 minutes) and the number of heart beats between 1-1.5 minutes was 90, between 2-2.5 it was 80, and between 3-3.5 it was 70, then the long form fitness index score would be: (100x300) / (240x2) = 62.5. Note: You are using total number of heart beats in 30 second period, not the rate (beats per minute) during that time. Fitness index (short form) = (100 x test duration in seconds) divided by (5.5 x pulse count between 1 and 1.5 minutes). Fitness index (long form) = (100 x test duration in seconds) divided by (2 x sum of heart beats in the recovery periods).

Muscular strength (sit ups):

Equipment: A mat for each subject & stopwatch.

Procedure: The subject is asked to lie on the back with the knee bend feet on the flower & heels not more than 12 inches from the buttocks. The angle at the knees should be less than 90^0 angles. The subject has to put the hands on the back of the neck with the figure clasped and has to place the elbows squarely on the mat the subject's feet are to be held by assistant to keep them in touch with the surface the subject is asked to tighten the abdomen muscles and bring the head and elbows to the knee the entire above processes constitutes one sit-up. The subject is asked to return to the starting position and to do sit-ups again.

Scoring: Complete sit ups in one minute will be the score of the test.

Muscular endurance (pull ups):

Equipments: - Bar- Chalk-Powder

Procedure: - The height of the bar should be such that when the subject hang from it with fully extend arms his feet do not touch the ground. The subject is ask to use the over hand grip with the palms facing away from the body. From the hanging

position the subject raises the body by the arms until the chin can be placed over the bar and then lowers the body full extension hand and repeated the pull ups as many times as possible. Only one trial is given unless it is obviously that the subject has not had a fair chance. Neither swinging, nor kicking the legs nor knee rising is allowed.

Scoring:- The maximum number of completed pull ups is the score which may be evaluated with the help of local norms.

Flexibility (Sit and reach) :

Equipment: A testing box or a flex measure and a yardstick.

Procedure: The subject is asked to remove shoes and place his/her feet against the testing box while sitting on the floor with straight knees. Now the subject is asked to place one hand on top of the other so that the middle fingers of both hands are together as the same length. The tester keeps his/her hand on the knees of the subject to keep them straight not allowing any bending of the knees. The subjects instructed to lean forwards and place his/her hands over the measuring scale lying on the top of the box with its10 inch mark coinciding with the front edge of the testing box. Then, the subject is asked to slide his/her hands along the measuring scale as far as possible without bouncing and to hold the farthest position for at least one second.

Scoring: Each subject is given three trials and the highest score nearest to an inch is recorded and 10 inches are subtracted from the recorded reading.

Mental health:

Assessing the mental health, the general mental health questionnaire developed by Goldberg in 1978, will be used. It assesses four components. Somatic

symptoms (1-7 items), Insomnia (8-14 items), Social Dys-function (15- 21 items), Severe Depression (22-28 items).

Anxiety:

Assessing the Anxiety, the Sport Competition Anxiety Test (SCAT) questionnaire developed by Martens et al. in 1990 will be used.

Analysis of data

To analyze the data mean, S.D and t test will be utilized the level of significant set up at 0.05 level of confidence.

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